

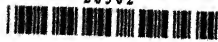
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**DYNAMIC COMPARATIVE ADVANTAGE AND  
TRADE COOPERATION IN NEWLY INDUS-  
TRIALIZING DEVELOPING COUNTRIES**

**R. S. Tiwari**

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# DYNAMIC COMPARATIVE ADVANTAGE AND TRADE COOPERATION IN NEWLY INDUSTRIALIZING DEVELOPING COUNTRIES\*

R.S. Tiwari

## Abstract

In early literature on trade and development traditionally employed comparative advantage in static setting has been considered as a basis of trade corporation, which does not take into account the changing pattern in country's, resource endowment structure, making thereby the studies less useful theoretically as well as operationally. Present paper empirically examines the NICs dynamic comparative advantage in association with complementarity and competitiveness, existing factor endowment structure and export-supply and import-demand structure as determinants of trade cooperation. Based on the general findings, the study offers block-wise, commodity-wise trade cooperation among newly industrializing developing countries (NICs).

## I. Introduction : Relevance of the Study

Early literature on trade and development widely recognised collective self-reliance as an important development objective in developing countries. So as to achieve this, industrialisation process in many developing

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countries was intensified, in which the emphasis was placed on growth of trade. Until mid 60s, the industrialization-led development strategy was considered as an inward oriented through reorienting indigenous investment, material resources, technology and protective measures, such as, tariffs, quota, taxes and exchange rate appreciation. Since mid 60s, it was but soon realised that industries, which grew under protective umbrella also required inputs to sustain their ongoing production activity, the demand for which could not be met from the domestic sources alone. This, in turn, forced developing countries to enhance their import-capacity through increase in export, thus, shifting the emphasis from inward-looking import-substitution to outward-looking export-promotion led industrialisation development strategy.

Export-promotion strategy, implying the exploitation of micro and macro economic efficiency through trading of factor's efficiency and commodities, though induced country's import-capacity but it was not, however, adequate to meet the increasing import-requirement needed for country's development process. This was due to the various internal supply bottlenecks and external demand constraints, in which the role played by tariff and non-tariff barriers received utmost significance. Whereas many developed countries had been successful in "skipping over" the effect of trade barriers through diversifying their products and markets, the developing countries could not be able to counter such adverse effects.



Tariff and non-tariff preferences demanded by developing countries from developed nations under various GATT rounds and UNCTAD conferences appeared no more than a psychological satisfaction. It either ended at the discussion stage or the extent of such preferences was such that could be easily waived by the restrictive clauses and criteria artificially imposed by the developed countries. Thus, room for expanding the export from developing into the developed countries was almost closed. Hence, trade among the developing countries was increasingly realised as second best solution than between the developing and the developed countries.

Present study, in view of this, aims at examining the (i) pattern of dynamic comparative advantage, (2) complementarity and competitiveness of export-commodities, (3) nature of factor endowment structure, (4) export-supply and import-demand structure and (5) intra-NICs trade cooperation.

## II. Comparative Cost Advantage: A Relevant Literature Review

What factors tend to determine the trade flows between countries is still a subject of lively debate and discussion among the trade theorists.<sup>1</sup> Ricardo's theory of comparative advantage, derived from the theory of value, described the differences in international factor productivities as determinant of trade between countries. This theory, based on too simplistic two-country - two-commodity model, described differences in labour factor productivity as

explanation of trade. Derived there from, a country should export those goods in which it possesses comparative labour cost advantage, while reciprocally import those goods portraying comparative labour cost disadvantage. Under classical wisdom, the comparative cost theory is thus determined by 'differences in international labour productivities', which, in turn, is determined by 'international division of labour' and 'economies of scale' on account of 'learning by doing' and availability of labour. Over time, relaxing the assumptions of 'differences in production techniques' and 'heterogeneity of factors' from Ricardo's, Theoretical treatment, another land mark in the trade theory was provided by neo-classical trade theorists in the form of factor proportions with which Heckscher (1919),<sup>2</sup> Ohlin (1939)<sup>3</sup> and Samuelson (1948)<sup>4</sup> were prominently associated.

According to Heckscher - Ohlin (H-O) model, a country specialises and exports those products the production of which requires relatively more abundant and cheap factor, where as, imports those products, which embody relatively more scarce and expensive factor of production. In H-O model, therefore, comparative abundance of factor, which, in turn determines the cost of factor of production, has been held as determinant of trade behaviour. Throry of comparative advantage both in its classical and neo-classical treatment, thus, implies as to how the flow of trade is determined by the micro and macro economic efficiency. It

is, therefore, a transaction between efficiency and inefficiency of factors and commodities between the two countries.

Soon after the development of H-O model, its empirical validity and unrealistic assumptions became the subject of frontal attack by trade economists. Factor price-equalisation by Samuelson (1948)<sup>5</sup>, extension of H-O model to more than two factors and commodities by Jones (1956)<sup>6</sup>, Leontief's paradox (1953)<sup>7</sup> and factor intensity by Larry and others (1968)<sup>8</sup> were some examples to conform as to how H-O model was questioned on theoretical and operational grounds. For instance, Leontief<sup>9</sup> discovered that where as export of US was labour intensive, her import was capital intensive, which was just in opposition to the H-O model. The empirical validity of Leontief was, however, further challenged<sup>10</sup>, which once again went back to support the H-O model indicating that whereas export of developing countries was labour-intensive, their import embodied capital as principal and scarce factor of production.

There has been further development under H-O premises, which provided deeper insights about the determinants of trade behaviour. One such approach was the introduction of human skills, which demarcated the "skill-content in the labour input as a separate factor of production.... This skill content is an asset of labour and is equivalent to physical capital and may be referred to as human capital.

The modified capital intensity of a product is defined by the ratio of total to physical and human capital to 'pure' labour input."<sup>11</sup>

There have been further sporadic efforts to explain trade behaviour among which mention must be made to 'product cycle theory' and 'availability hypothesis'. "Successive stages of standardisation characterise the product cycle. Initially a new good is made in small lots, each firm with its own variety. Manufacturing processes are highly experimental; many different techniques are given in try. But as markets grow, changes take place; national and international specifications are agreed upon. Simultaneously, the number of processing technologies decreases as inferior methods are weeded out. The surviving techniques grow more familiar and marketing channels become better established. The expansion of output transforms the items from "side line" to "main line" status... The product cycle accounts and technological gap accounts clearly belong to same family. Both stresses the sequential development of production theory. But while the technological gap emphasises time, product cycle emphasises the transition from product differentiation to product standardisation".<sup>12</sup>

According to product cycle model, a product has three stages. At the first stage, the composition of workforce in terms of relative proportion of highly skilled compared to unskilled workforce in the process of production is a basic criterion. At the second stage, although the tendency is more towards

the use of capital and high level of managerial skills. but their combination declines compared to the first stage. At the third stage, the capital and managerial skills are combined with unskilled labour force to produce the output.

Hirsch<sup>13</sup> strongly feels that developed countries should concentrate their exports on "new" and "grown" products that command abundance of "engineering know-how", capital and management, while developing countries on "mature products" requiring more of unskilled labour. This again supports the factor proportion theory. The "availability hypothesis" provides, by and large, a similar explanation for trade behaviour. According to this, a country should import those goods that are not available domestically which, in turn, should export those that are abundance in the home market<sup>14</sup>. It is viewed that "natural resources, innovation (technological progress) and product differentiation are determinants of availability"<sup>15</sup>.

In the above discussions, "natural conditions" in the classical theory, "relation between capital and labour" in neo-classical theory and "skill factor in relation to capital and labour" in product cycle theory had been held as major determinants of comparative advantage and, therefore, the country's trade pattern. Hirsch (1974)<sup>16</sup> going a step further classified export-commodities under three categories, such as, (1) Ricardo goods, (2) Heckscher-Ohlin goods and (3) product cycle goods. Primary commodities, requiring relatively more of natural factor endowment, are classified

under Ricardo goods, while manufacturing goods, requiring more of technology and R and D, under H-O goods. Trade in manufactures between developed and developing countries (North-South trade) or (South-North trade) is the example of H-O model. Products other than above have been put under product cycle on the basis of recent innovations, research and development. Thus, "product cycle goods are distinguished from Heckscher-Ohlin goods by the fact that production functions of new goods vary from country to country and because the cost of international technology transfer is likely to be high. To establish comparative advantage in new goods, it is not sufficient to compare the relative shares of capital, unskilled and skilled labour needed in several countries. The cost of technology transfer must be added to calculate comparative costs"<sup>17</sup>. Studies, per-se deal the comparative advantage in static homework, which ignores the changing pattern of factor endowment structure of a country. Thus, comparative advantage as a determinant of trade pattern needs to be examined in dynamic rather than in static setting.

### III. Measurement of Comparative Advantage: Some Discussions

Invariably, almost all studies on comparative advantage faced the severe problem of measurement. Alternative approaches were employed for estimating the comparative advantage, such as, (1) input-output technique,<sup>18</sup> (2) factor



intensity through elasticity of substitution<sup>19</sup> and (3) export performance index.<sup>20</sup> As far as the first and second approaches are concerned, a number of criticisms has been offered. The most common among all is that these have overemphasised the cost elements, which have ignored the consideration of non-price factors. For instance, it is held that : "cost considerations will not be sufficient... and a complete explanation of comparative advantage would have to take account of the effects of non-price factors".<sup>21</sup>

Export performance index is yet another method used for measuring the comparative cost advantage of a country vis-a-vis the others. It reflects all types of costs and non-price factors "like good will, quality, service facilities, etc. Since this pattern in comparative advantage is revealed by the observed pattern of trade flows, it is called revealed comparative advantage. Thus, the increase in export performance index of the exporting country as compared to competitor country or country's group reflects the increase in exporting country due to the effect of revealed comparative advantage. The mean of revealed comparative advantage, a part from considering the 'relative cost element' also captures the "differences in non-price factors".<sup>22</sup> Thus, by including the cost and non-price factors, this method makes the departure from the earlier methods. In view of this, we make the use of export performance index, which is worked out by using the following well known Balassa's method:<sup>23</sup>

$$EPI = 1/2 \left[ \frac{e_{ij}(1)}{e_j(1)} + \frac{e_{ij}(1)}{e_j(1)} \left( \frac{e_{ij}(1)}{e_{ij}(0)} / \frac{e_j(1)}{e_j(0)} \right) \right]$$

Where,

$e_{ij}(0)$  = Average share of  $j$ th country in the total export of  $i$ th commodity in the base year;

$e_j(0)$  = Average share of all commodities of the exporting country in the base year;

$e_{ij}(1)$  = Average share of  $j$ th country in the total export of  $i$ th commodity in the current year; and

$e_j(1)$  = Average share of all commodities of the exporting country in the current year.

Thus, by using the above method, it is possible to compare the export performance index of the exporting country vis-a-vis the competitive countries. In the present study, export performance index has been separately worked out for 9 selected NICs (Argentina, Brazil, India, Israel, Korea Republic, Malaysia, Pakistan, Singapore and Turkey). Each of the NICs has been separately considered as exporting country, whereas, rest of the world as a unit of competitors. Present study captures more recent periods, which includes the averages of (1) 1969-72 to 1974-76, (2) 1974-76 to 1979-82 and (3) 1979-82 to 1984-87. Studies covering earlier periods are also available. Present study uses data at 3 digit levels of SITC groupings. Data beyond this level are not found available on a consistent basis from published sources. Commodity Trade Statistics, Year Book of International Trade Statistics, by United Nations, World Table by World Bank and Monthly Statistics of Foreign Trade of India by DGCI & S, Calcutta have been used as basic sources of information.



#### IV. Dynamic Comparative Advantage in Newly Industrializing Developing Countries

Attempts have been made to identify the export-commodities (1) which retained their revealed comparative advantage, (2) portrayed shift in their revealed comparative advantage and (3) new commodities which emerged with revealed comparative advantage. This assumed significance because changing pattern of comparative advantage is normally accompanied with changing pattern of factor endowment structure. Such analysis has been presented in Table-1.

##### IV.1 Retention of Export-Products With Revealed Comparative Advantage

Several products in traditional as well as in non-traditional sectors retained their revealed comparative advantage over time. Such export-commodities are : fertilizer crude (271), mineral manufacture (663), pearl precious, semi-precious stones (667), copper (682) and tools (695) from the traditional and engines and motors (714) from the non-traditional sector in Israel. The corresponding products in Singapore are cereals, etc. (048), hides and skins (211), fuel wood and charcoal (241), sulphur (274) from the traditional and pigments paints (533) and printed matter

Table-1 : Dynamic Revealed Comparative Advantage By Sectors and NICs Over Time

NICs	IInd Period						Final Period					
	Products having RCA in previous period retained in the second period		Discontinuity in RCA on products during 1974-76 to 1979-82 over 1969-72 to 1974-76		Addition of new products with RCA during second over first period		Products having RCA in second period retained in the final period		Discontinuity in RCA on products during 1979-82 to 1984-87 over 1974-76 to 1979-82		Addition of new products with RCA during final over second period	
	T (No.)	NT (No.)	T (No.)	NT (No.)	T (No.)	NT (No.)	T (No.)	NT (No.)	T (No.)	NT (No.)	T (No.)	NT (No.)
Argentina	13	7	21	9	16	14	4	1	25	20	29	14
Brazil	15	9	14	7	16	12	13	12	16	9	18	7
India	32	15	2	-	3	-	8	1	24	14	19	21
Israel	10	-	13	-	19	16	11	8	22	8	10	20
Korea Republic	19	5	15	10	15	8	13	5	20	8	5	20
Malayasia	9	1	25	13	25	14	8	5	22	10	23	13
Pakistan	15	2	26	6	21	11	11	1	25	12	17	21
Singapore	8	3	18	18	26	7	12	4	22	8	12	18
Turkey	15	3	23	9	14	15	6	3	25	15	24	15
Average	15	6	17	8	17	11	6	4	22	12	17	17

T = Traditional Sector

NT = Non-Traditional Sector

Source: Commodity Trade Statistics, United Nations, Year Book of International Trade Statistics, United Nations and Monthly Statistics of Foreign Trade of India, DGCI & S, Calcutta, Various Issues.

(892) from the non-traditional sector, which have portrayed revealed comparative advantage on a continuous basis.

Such products in Brazil are meat fresh (011), coffee and substitute (071), feeding stuffs (081), food preparations (099), vegetable fibres (265), fixed vegetable oils (422), paper (642), fixed vegetable oils (422), paper (642) and iron and steel (672) from the traditional and carboxylic acids (513), nitrogen function compounds (514), products of condensation (582), steam engines (712), other power generating machinery (718), and machines non-electric (719) from the non-traditional sector. Similarly, such products in Malaysia include: cocoa (072) and processed animal vegetable oil (431) under the traditional and perfumery cosmetics (553) under the non-traditional sector. These in Turkey are : wheat etc. (046), vegetable etc. (054) and textile yarn (651) under the traditional sector.

In Pakistan, such products include : milk and cream (022), butter (023), rice (042), alcoholic beverages (112) and sulphur (274) in the traditional sector, while clothing (841) in the non-traditional sector; and in Korea Republic, woven man made (653), lime, cement, building products (661), mineral manufactures (663), iron and steel castings (679), wire products (693), steel copper, nails nuts (694) and base metal household equipment (697) in the traditional, while travel goods (831) and footwear (851) in the non-traditional sector. Similarly, such products in Argentina are: (meat fresh, chilled frozen (011), maize unmilled (044) and

vegetable etc. (054) from the traditional sector. In India the corresponding products include : (wheat etc. unmilled (041), barely unmilled (043), tea and mate (074), spices (075), seeds for other fixed oils (223), cotton (263), clay refractory building products (662) and metal manufactures (698) from the traditional and pigments, paints (533) from the non-traditional sector.

#### IV.2 Products Showing Discontinuity in Revealed Comparative Advantage

We may now discuss those commodities in which revealed comparative advantage was discontinued over different periods. Revealed comparative advantage confined on 26 products in the first period in Pakistan, 25 in Malaysia, 23 in Turkey 21 in Argentina, 18 in Singapore, 15 in Korea Republic, 14 in Brazil, and 13 in Israel within the traditional sector was discontinued in the second period. Such products within the non-traditional sector were found to be 21 in Isreal, 18 in Singapore, 13 in Malaysia, 10 in Korea Republic, 9 each in Turkey and Argentina, 7 in Brazil and 6 in Pakistan.

Similarly, revealed comparative advantage during second period, which relied on 25 traditional products each in Argentina, Pakistan and Tuekey, 24 in India, 22 each in Israel, Singapore and Malaysia, 20 in Korea Republic, and 16 in Brazil was discontinued during the final period. Such

products within the non-traditional sector were 20 in Argentina, 15 in Turkey, 14 in India, 12 in Pakistan, 10 in Malaysia, 9 in Brazil and 8 each in Israel, Korea Republic and Singapore (Table-1).

#### IV.3 Addition of New Products with Revealed Comparative Advantage

During the second period, 26 products in Singapore, 25 in Malaysia, 21 in Pakistan, 19 in Israel, 15 in Korea Republic, 16 each in Argentina and Brazil, 14 in Turkey and 3 in India, entered as new products with revealed comparative advantage within the traditional sector. Corresponding products within the non-traditional sector were 16 in Israel, 15 in Turkey, 14 each in Argentina and Malaysia, 12 in Brazil, 11 in Pakistan, 8 in Korea Republic and 7 in Singapore. Similarly, new products with revealed comparative advantage, entered during the final period within the traditional sector were : 29 in Argentina, 24 in Turkey, 23 in Malaysia, 19 in India, 18 in Brazil, 17 in Pakistan, 12 in Singapore and 5 in Korea Republic. Similar products within the non-traditional sector were : 21 each in India and Pakistan, 20 each in Israel and Korea Republic, 18 in Singapore, 15 in Turkey, 14 in Argentina, 13 in Malaysia and 7 in Brazil (Table-1). It would imply that during the second period, majority products in majority of NICs emerged in the traditional sector with revealed comparative advantage. During the final period, the equal number of products both in

traditional and non-traditional sector emerged as new products with revealed comparative advantage.

In all selected a newly industrializing developing countries (NICs), 17 products from traditional and 8 from non-traditional sector, which had revealed comparative advantage in the first period were discontinued during the second period. This was seen compensated by the entrance of 17 products from traditional and to 11 products from the non-traditional sector with revealed comparative advantage. During the final period, 22 products from traditional and 12 products from non-traditional sector having revealed comparative advantage were discontinued, whereas, equal number of products (17) were added each in to the traditional and the non-traditional sector with revealed comparative advantage (Table-1).

#### V. Nature of Country's Competitiveness and Complementarities

Rank of export performance indices also ascribes the state of competitiveness and complementarities. If the absolute difference in ranks between two export-countries is less than 20, they are considered as keen competitors. Further, if it is more than 20 but less than 40 they are considered as marginal competitors. However, if absolute difference is more than 40, they are denoted as complementary countries. Also if there exists only one either keen or marginal competitor, market is characterised as duopolistic.

If the number of keen or marginal competitors exceeds to one but is less than four, the market is said to be oligopolistic in character. Finally, if the number of keen and marginal competitors are four or more, it is described as perfectly competitive market.<sup>25</sup> Table-2 classifies the selected NICs by nature of competitive markets according to rank of export performance indices for the top 50 export-commodities, while Appendix-A describes the export-commodities at 3 digit levels of SITC groupings.

Based on the methodology per-se, during the period 1979-82 to 1984-87, a majority of products in traditional sector in Argentina, Brazil, India and Turkey faced the duopolistic market structure, while that in Israel, Malaysia, Pakistan and Singapore, the oligopolistic competition prevailed. In Korea Republic, however, majority of traditional commodities were found complementary in character. For example, 13 out of 33 traditional products in Argentina; 10 out of 33 in Brazil; 11 out of 29 in India; and 15 out of 31 in Turkey were seen facing duopolistic competition.

In Argentina, meat prepared preserved (014), cheese and curd (024), shell fish, fresh frozen (036), barely unmilled (043), fruits, nuts, fresh dried (057), feeding stuff for animals (081) under food and live animals (0.0); cork, natural, raw waste (244); under crude materials inedibles (2.0); residual petroleum products (335) under minerals (3.0); animal oils and fats (411), fixed vegetable oils and



Table-2: Classification of Products By Competitive Markets in Newly Industrializing Developing Countries : 1979-82 to 1984-87

Nature of competitive market	Argentina		Brazil		India	
	1979-82 - 1984-87		1979-82 - 1984-87		1979-82 - 1984-87	
	(No. of Products)		(No. of Products)		(No. of Products)	
	T	NT	T	NT	T	NT
A. Duopolistic market	13	4	10	4	11	9
B. Oligopolistic market	8	7	11	3	9	4
C. Perfectly competitive market	6	6	6	5	4	2
D. Complementary countries	6	-	6	5	5	6
Total	33	17	33	17	29	21

Nature of competitive market	Israel		Korea Republic		Malaysia	
	1979-82 - 1984-87		1979-82 - 1984-87		1979-82 - 1984-87	
	(No. of Products)		(No. of Products)		(No. of Products)	
	T	NT	T	NT	T	NT
A. Duopolistic market	4	10	4	7	6	4
B. Oligopolistic market	12	13	4	16	11	11
C. Perfectly competitive market	3	5	4	-	3	3
D. Complementary countries	2	1	6	9	10	2
Total	21	29	18	32	30	20

Nature of competitive market	Pakistan		Singapore		Turkey	
	1979-82 - 1984-87		1979-82 - 1984-87		1979-82 - 1984-87	
	(No. of Products)		(No. of Products)		(No. of Products)	
	T	NT	T	NT	T	NT
A. Duopolistic market	7	3	6	4	15	4
B. Oligopolistic market	13	18	8	14	9	9
C. Perfectly competitive market	4	3	6	4	3	6
D. Complementary countries	2	-	5	4	4	-
Total	26	24	24	26	31	19

T = Traditional Sector

NT = Non-Traditional Sector

Source: Commodity Trade Statistics United Nations, Year Book of International Trade Statistics, United Nations and Monthly Statistics of Foreign Trade of India, DGCI & S, Calcutta, Various Issues.



soft (423) under animal vegetables (4.0); and leather (611), veneers, plywood (631) and iron and steel, universal plate, sheet (674) under manufactured goods classified by materials (6.0), were seem facing duopolistic market structure. Traditional products facing similar competition in Brazil were : meat fresh, chilled, frozen (011), other cereals meal flour (047), coffee and substitutes (071), feeding stuffs for animals (081), iron ore concentrates (281), fixed vegetable oils soft (423), veneers, plywood (631), paper etc. (642), iron ore, primary forms (672) and non-ferrous base metals (689).

In India, traditional products facing similar nature of market competition were: meat, dried, salted, smoked (012), meat prepared preserved, nes (014), shell fish, fresh frozen (036), wheat etc. unmilled (041), barely unmilled (043), spices (075), stone sand and gravel (273), iron ore concentrate (281), materials of rubber (621), paper etc. (642) and non-ferrous base metals (689). Similarly, in Turkey, such products were: cheese and curd (024), fish etc. prepared preserved nes (037), wheat etc. meal or flour (046), vegetables etc. fresh simply preserved (054), vegetable etc. (056), fruits, preserved, prepared (058), other crude minerals (278), crude animal materials nes (291), animal oils and fats (411), flour covering etc. (659), iron and steel primary forms (672), iron, steel, shapes etc. (673), copper (682) and zinc (686).

Among the traditional sector, products facing oligopolistic market structure in Israel were: eggs, birds, fresh (025), fruits, preserved (058), chocolate (073), edible products (098), other crude minerals (278), crude vegetable materials (292), mineral manufactures (663), iron and steel casting (679), silver platinum (681), wire products (693) etc; and that in Malaysia were: eggs (025), coffee and substitutes (071), edible products (098), seeds for other fixed oils (223), waste of textile fabrics (269), sulphur (274), iron and steel scrap (282), base metal ore concentrates (287), fur skins tanned dressed (613), veneers plywood (634) and pig iron (671). Similarly, such products in Pakistan were: fish etc.(035), rice (042), cocoa (072), seeds for other fixed oil (223), rubber synthetic (233), sulphur (274), crude animal (291), fur skins (613), veneers plywood (634), paper and paper board (641), textile yarn (651), iron and steel tube (678) and lead (685); and in Singapore meat dried (012), rubber synthetic reclaimed (233), sulphur (274), fur skins, tanned, dressed (613), veneers, plywood (634), tools (695) and base metals (697).

So far as the nature of market structure in non-traditional goods is concerned, majority of goods in Argentina, Brazil, Israel, Korea Republic, Malaysia, Pakistan, Singapore and Turkey faced the oligopolistic market structure, while that in India, duopoly market competition prevailed. Non-traditional Products facing duopolistic market competition in India were: pigments paints

(533), plastic materials (585), starch insulin etc. (592) within the chemicals (5.0); other power generating machinery (718), railway vehicles (791) within the machinery and transport equipment (7.0); and furniture etc. (821), men's outer wear not knit (842) and meters and counters nes (873) within the miscellaneous manufactured articles (8.0). Thus, a majority of traditional goods in Israel, Malaysia, Pakistan and Singapore faced the oligopolistic market structure, while in Argentina, Brazil, India and Turkey, a fierce duopolistic market competition prevailed. A majority of traditional goods in Korea Republic was found complementary in so far as 9 NICs were concerned. As compared to above, majority of goods in non-traditional sector in majority of NICs were found facing oligopolistic market structure.

#### VI Nature of Factor Endowment Structure

We may now examine the relationship of revealed comparative advantage over time among each NICs in different import-markets. It would roughly indicate the state of similarity/dissimilarity in resource endowment structure and the trade regime. Spearman's rank correlation has been worked out between rank of export performance indices of one NICs at 3 digit levels of SITC commodities with the rest in different import-markets. Statistically significant correlation coefficient below 0.5 or above would roughly indicate the higher degree of dissimilarity/similarity in

Table-3 : Spearman's Rank Correlation Coefficients Between Rank of Export Performance Indices of Individual NICs and Remaining NICs in the Developed Market Economies : 1979-82 - 1984-87

NICs	NICs								
	Argen- tina	Brazil	India	Israel	Korea Republic	Malaysia	Paki- stan	Singa- pore	Turkey
Argentina	1.0000	0.1657***	0.3197*	-0.0139	-0.0727	-0.0818	0.1707***	0.0012	0.4684*
Brazil	0.1657***	1.0000	0.2087**	0.2275**	0.1389	0.1366	-0.0108	0.1602	0.1793***
India	0.3197*	0.2087**	1.0000	0.3286*	0.2736*	0.1204	0.1255	0.2120**	0.4400*
Israel	-0.0139	0.2275**	0.3286*	1.0000	0.3958*	0.3054*	-0.1704***	0.3810*	0.1836***
Korea Republic	-0.0727	0.1389	0.2736*	0.3958*	1.0000	0.2263**	-0.0767	0.3862*	0.1505
Malaysia	-0.0818	0.1366	0.1204	0.3054*	0.2263**	1.0000	-0.0238	0.3677*	0.0263
Pakistan	0.1707***	-0.0108	0.1255	-0.1704***	-0.0767	-0.0238	1.0000	-0.0136	0.0808
Singapore	0.0012	0.1602	0.2120**	0.3810*	0.3862*	0.3677*	-0.0136	1.0000	0.1429
Turkey	0.4684*	0.1793***	0.4400*	0.1836***	0.1505	0.0263	0.0808	0.1429	1.0000

Note : \* Indicates significant at 1 per cent level.  
 \*\* Indicates significant at 5 per cent level  
 \*\*\* Indicates significant at 10 per cent level.

Source : Commodity Trade Statistics, United Nations, Year Book of International Trade Statistics, United Nations and Monthly Statistics of Foreign Trade of India, DGCI & S, Calcutta, Various Issues.

each NICs internal factor endowment structure vis-a-vis the rest.

Resource endowment structure for the products directed to developed market economies during 1979-82 - 1984-87 in Argentina was found dissimilar with 3 NICs (India, Pakistan and Turkey); Brazil's with 3 NICs (India, Israel and Turkey); India with 6 NICs (Argentina, Brazil, Israel, Singapore, Korea Republic and Turkey); Israel's with 6 NICs (India, Korea Republic, Malaysia, Pakistan, Singapore and Turkey); Korea Republic's with 4 NICs (India, Israel, Malaysia and Singapore); Malaysia's with 3 NICs (Israel, Korea Republic and Singapore); Singapore's with 5 NICs (Brazil, India, Israel, Korea Republic and Malaysia); and Turkey's with 4 NICs (Argentina, Brazil, India and Israel). Factor endowment structure in individual NICs with the rest was found to be similar in character in developed market economies.

We may now discuss the nature of factor endowment structure for individual NICs vis-a-vis the rest in developing countries. During 1974-82 to 1984-87, resource endowment structure (Table-4) in Argentina was found to be dissimilar with 2 NICs (India and Singapore); Brazil's with 2 NICs (Korea Republic and Pakistan); India's with 3 NICs (Argentina, Malaysia and Singapore); Korea Republic's with 3 NICs (Brazil, Pakistan and Singapore); Malaysia's with 2 NICs

Table - 4 : Spearman's Rank Correlation Coefficients Between Rank of Export Performance Indices of Individual NICs and Rest of NICs in Developing Countries : 1979-82 and 1984-87

NICs	NICs								
	Argentina	Brazil	India	Israel	Korea Republic	Malaysia	Pakistan	Singapore	Turkey
Argentina	1.0000	0.0069	0.1859***-0.0244	0.0521	-0.1210	0.0871	0.2789*	-0.0760	
Brazil	0.0069	1.0000	0.0264	0.0303	0.22118**0.0105	0.1824***0.0531	0.1496		
India	0.1859***	0.0264	1.0000	-0.0817	0.1180	-0.4439*	0.0762	0.2920*	0.0119
Israel	-0.0244	0.0303	-0.0817	1.0000	0.1182	-0.0696	0.0548	0.0235	-0.0402
Korea Republic	0.0521	0.2118**	0.1180	0.1182	1.0000	-0.1300	0.4080*	0.2482**	0.0555
Malaysia	-0.1210	0.0105	-0.4439*	-0.0696	-0.1300	1.0000	-0.0475	-0.2991*	-0.0195
Pakistan	0.0871	0.1824***	0.0762	0.0548	0.4080*	-0.0475	1.0000	0.1203	0.1024
Singapore	0.2789*	0.0531	0.2920*	0.0235	0.2482**	-0.2991*	0.1203	1.0000	0.1058
Turkey	-0.0760	0.1496	0.0119	-0.0402	0.0555	-0.0195	0.1024	0.1058	1.0000

Note : \* Indicates significant at 1 per cent level.

\*\* Indicates significant at 5 per cent level

\*\*\* Indicates significant at 10 per cent level.

Source : Commodity Trade Statistics, United Nations, Year Book of International Trade Statistics, United Nations and Monthly Statistics of Foreign Trade of India, DGCI & S, Calcutta, Various Issues.

(India and Singapore); Pakistan's only with Korea Republic; and Singapore's with 4 NICs (Argentina, India, Korea Republic and Malaysia). Factor endowment structure in each NICs with the rest of NICs was found to be identical in developing market economies.

It is interesting finding that resource structure of 6 NICs (Israel, Argentina, Brazil, Malaysia, Pakistan and Turkey) was generally found to be identical vis-a-vis the most of NICs under consideration. It is significant to note that resource endowment dissimilarity was pronounced more significantly in developed than that in developing economies. It was found that all NICs except Argentina underlined the dissimilarity in resource endowment vis-a-vis the rest NICs in to the world market (Table-5).

The findings thus suggest that there have been a general resource structure dissimilarity among NICs for the goods exported to developed countries (DMEs) and the world, which implied the non-homogeneous production structure in most of NICs. In sharp contrast to this, a relatively homogeneous factor endowment structure was observed for the products exported to the developing countries (DCs).



Table - 5 : Spearman's Rank Correlation Coefficients Between Rank of Export Performance Indices of Individual NICs and Rest of NICs in the World : 1979-82 - 1984-87

NICs	NICs								
	Argentina	Brazil	India	Israel	Korea Republic	Malaysia	Pakistan	Singapore	Turkey
Argentina	1.0000	0.0625	0.1481	0.1288	0.0364	0.1403	0.1057	0.1027	0.0805
Brazil	0.0625	1.0000	0.2077**	0.3138*	0.3218*	0.2834*	0.2228**	0.2474**	0.2937*
India	0.1481	0.2077**	1.0000	0.3506*	0.3346*	0.2833*	0.2833*	0.2933*	0.2582*
Israel	0.1288	0.3138*	0.3506*	1.0000	0.4060*	0.3492*	0.2853*	0.3415*	0.2839*
Korea Republic	0.0364	0.3218*	0.3346*	0.4060*	1.0000	0.3457*	0.2482**	0.2904*	0.3185*
Malaysia	0.1403	0.2834*	0.2833*	0.3492*	0.3457*	1.0000	0.3151*	0.3989*	0.2894*
Pakistan	0.1057	0.2228**	0.2833*	0.2853*	0.2482*	0.3151*	1.0000	0.3706*	0.2413**
Singapore	0.1027	0.2474**	0.2933*	0.3415*	0.2904*	0.3989*	0.3706*	1.0000	0.3201*
Turkey	0.0805	0.2937*	0.2582*	0.2839*	0.3185*	0.2894*	0.2413**	0.3201*	1.0000

Note : \* Indicates significant at 1 per cent level.  
 \*\* Indicates significant at 5 per cent level  
 \*\*\* Indicates significant at 10 per cent level.

Source : Commodity Trade Statistics, United Nations, Year Book of International Trade Statistics, United Nations and Monthly Statistics of Foreign Trade of India, DGCI & S, Calcutta, Various Issues.



# VIII. Correspondance Between Export-Supply and Import-Demand Structure

We may now examine the export-supply and the import-demand structure among NICs. This is done with the help of ratio of commodity correspondance, which has been worked out by using following Linemann's method<sup>26</sup>:

$$C_{pq} = \sqrt{\frac{1}{n} \sum_{i=1}^n \frac{C_i^p}{m_i^q}}$$

Where,  $C_{pq}$  = Coefficient of correspondance between export of p and import of q country.

$C_i^p$  = Proportion of ith commodity in the export of country p.

$m_i^q$  = Proportion of ith commodity in the import of country q.

By using above method, commodity correspondance ratios have been worked out for the year 1987 in Table-6. It was found that export-supply of Argentina corresponded well with import-demand structure of Brazil, India, Israel, Pakistan and Turkey; Brazil's with Argentina, Israel, India, Pakistan and Korea Republic; India's with Pakistan, Israel, Argentina, Brazil and Turkey; Israel's with Pakistan, India, Korea Republic, Brazil and Argentina; and Korea's with Singapore, Israel, Pakistan, India and Turkey. Similarly, export-supply of Malaysia matched well with import-demand structure of Korea Republic, Brazil, Pakistan and India; Pakistan's with India, Israel, Argentina, Turkey, and Brazil; Singapore's

Table - 6 : Coefficients of Commodity Correspondance Between Export-supplies and Import-Demand Structure in Selected Newly Industrializing Developing Countries: 1987

Exporting Countries	Importing Countries								
	Argen- tina	Brazil	India	Israel	Korea Repub- lic	Malay- sia	Paki- stan	Singap- ore	Tur- key
Argentina	--	0.1594	0.1285	0.1241	0.0959	0.1039	0.1225	0.0860	0.1162
Brazil	0.1493	--	0.1308	0.1319	0.1179	0.1105	0.1285	0.1158	0.1179
India	0.1497	0.1404	--	0.1594	0.1342	0.0980	0.1628	0.0960	0.1404
Israel	0.1288	0.1323	0.1503	--	0.1439	0.1025	0.1517	0.1265	0.1257
Korea Republic	0.1034	0.1261	0.1411	0.1523	--	0.1118	0.1435	0.1549	0.1364
Malaysia	0.0990	0.1166	0.1034	0.1030	0.1179	--	0.1049	0.1483	0.1020
Pakistan	0.1480	0.1411	0.1700	0.1670	0.1277	0.1015	--	0.0762	0.1425
Singapore	0.0911	0.1149	0.0970	0.1122	0.1414	0.1300	0.0872	--	0.0995
Turkey	0.1490	0.1597	0.1523	0.1503	0.1330	0.0938	0.1543	0.0927	--

Source: Commodity Trade Statistics, United Nations, Year Book of International Trade Statistics, United Nations and Monthly Statistics of Foreign Trade of India, DGCI & S, Calcutta, Various Issues.

with Korea Republic, Malaysia, Brazil, Israel and Turkey; and that of Turkey's with Brazil, Pakistan, India, Israel and Argentina (Table-6). Thus, there exists a general correspondence between the supply of export and the demand for import among the selected NICs.

#### VIII. Formation of Trade Cooperation : Some Possible Considerations

Above measures can be applied for consideration of trade cooperation.<sup>27</sup> It may be mentioned that commodities showing revealed comparative advantage in a static framework have generally been considered for trade cooperative move, which, of course, do not take into account of changing pattern of comparative advantage i.e., dynamic comparative advantage product-wise. Since a change in comparative advantage of commodities is intrinsically linked with change in their factor endowment structure, it would be more realistic if trade cooperation is considered on dynamic than that on traditionally employed static comparative advantage basis. In this study, the consideration of trade cooperation is, therefore, based on dynamic rather than the static framework. In association with this, nature of competition, changes in factor endowment structure and commodity correspondence have also been taken into account.

The formation of trade cooperation is justifiable on the ground that most of NICs in their traditional and non-

traditional commodities faced the fierce competition and thus efforts towards this direction, could possibly minimise, if not eliminate, the element of competition. Since most of NICs faced the duopolistic market competition for marketing of their traditional and oligopolistic competition for their non-traditional commodities, it would imply that any efforts by any NICs would only result in to the cut-throat competition including price-war among themselves. This could be avoided by forming the intra-NICs trade cooperation through cost reducing and price decisive measures.

Based on above considerations, selected 9 NICs have been classified into three distinct blocks, such as, (I) Singapore, India, Argentina, Pakistan and Turkey, (II) Korea Republic and Israel and (III) Brazil and Malayasia. First block may specialise commodities with in food and live animals (0.0), beverages and tobacco (1.0) and crude materials inedibles except fuels (2.0), and may export to the rest of the blocks. Similarly, second block may specialize various commodities within manufactured goods classified by materials (6.0) and miscellaneous manufactured articles (8.0) and may export to rest of the blocks. Third block reciprocately may specialize various commodities with in animal vegetable oils and fats (4.0), chemicals (5.0) and machinery and transport equipment (7.0) and may export to rest of the blocks.

The formation of intra-NICs trade cooperation has been presented in Table-7 at 5 digit levels of SITC groupings.

Table - 7 : Classification of Export-Commodities into Blocks of Selected Newly Industrializing Developing Countries Based on Dynamic Revealed Comparative Advantage

Block	Export-Commodities
I	
India, Singapore, Argentina, Pakistan, Turkey	Meat, fesh, chilled, frozen (011); Wheat etc. unmilled (041); Barley unmilled (043); Maize unmilled (044); Wheat etc. meal or flour (046); Cereal etc. preparations (048); Vegetable etc. fresh simply preserved (054); Tea and mate (074); Spices (075); Hides, skins, etc. furs raw (211); Seeds for other fixed oils (223); Fuelwood and charcoal (241); Cotton (263) and Sulphur, unroasted, iron pyrites (274).
II	
Korea Republic, Israel	Woven man-made fabric (653); Lime, cement, building products (661); Mineral manufactures nes (663); Pearl, precious, semi precious stone (667); Iron and steel casting unworked (679); Copper, excluding cement copper (682); Wire products non-electric (693); Steel copper nails, nuts etc. (694); Tools (695); Base metal household equipment (697); Travel goods, hand bags (831); Footwear (851).
III	
Brazil, Malaysia	Fixed vegetable oil, non-soft (422); Processed animal vegetable oil etc. (431); Carboxylic acids, etc. (513); Nitrogen function compounds (514); Perfumery cosmetics etc. (553); Products of condensation etc. (582); Steam engines, turbines (712); Other power generating machinery (718); Machines, nes, non-electric (719).

Such an attempt may further accentuate trade more intensively among NICs, if blocks so formed are converted into a cartel.<sup>28</sup> Such a cartel comprising of selected newly industrializing developing countries particularly in non-traditional goods, in turn, is required to follow common strategies in respect of price decisions, cost reduction, tariff and non-tariff reduction etc. through tacit agreement. May be that concerted efforts towards joint ventures based on technological, industrial and financial cooperation may stimulate the intra-NICs trade among themselves. However, successfulness of cartel in selected NICs and in developing countries is yet to be ensured under the given international trading environment.

#### IX. Policy Implication

Theory of comparative advantage in its conventional and non-conventional treatment implies as to how the flows of trade between countries are determined by the micro and macro economic efficiency. It is, therefore, simply a transaction between efficiency and inefficiency of factors and commodities. Overtime, it has been noticed that share of export from traditional commodities declined, where as, that from non-traditional items improved in country's export basket. To explain this, we examined the comparative advantage of export-commodities at 3 digit levels by identifying the pattern of revealed comparative advantage in a dynamic setting.

It is found that when we moved from first to second period, revealed comparative advantage confined on traditional sector goods in Malaysia, Pakistan and Argentina shifted towards the non-traditional goods exports, where as, a reverse was true in Korea Republic, Singapore and Turkey. The observed transformation in revealed comparative advantage in former was in line with the product cycle theory and the stages of comparative advantages once held by Balassa<sup>29</sup> where as, latter, was in line with factor proportion theory.

During the final period, the revealed comparative advantage in Pakistan, Malaysia and Argentina confined in non-traditional goods earlier shifted towards the traditional goods, while in Brazil, India, Israel, Korea Republic, Singapore and Turkey retained the revealed comparative advantage on traditional goods exports. It, thus, manifestes the general applicability of factor proportion theory held under H.O. model. Revealed comparative advantage relying mainly on traditional goods was primarily on account of advantages arising out of country's cheap labour conditioned by the local resource endowment structure, where as, on non-traditional goods to the distortions introduced by the trade policies.

Study further examined the nature of competition and the correspondance between the export-supply and import-demand structure among NICs. Broadly speaking, most of the traditional commodities were found facing duopolistic

competition while non-traditional commodities oligopolistic market structure characterised by cut-throat competition in terms of price and cost for marketing of their products. Further, dissimilarity in factor endowment structure was underlined among NICs in to the developed market economies (DMEs) and to the world. However, identical factor endowment structure was revealed for the products exported to developing countries (DCs). Correspondance between export-supply and import-demand was generally found to be strong among NICs.

Thus, under the given market structure, any attempt to enhance export from one NIC to an other would be futile and, therefore, intra-NICs trade cooperation is called for. It is suggested that selected NICs should form three distinct blocks in order to enhance export among themselves. The first block may specialize in primary commodities within the broad groups of food and live animals (0.0), beverages and tobacco (1.0) and crude materials (2.0) and may export to rest of the blocks. Second block, reciprocately, may specialise in commodities within the manufactured goods (6.0) and miscellaneous manufacturing (8.0) and may export to the rest of the blocks. Similarly, third block, may specialise in commodities under animal vegetable oils and fats (4.0), chemicals (5.0) and machinery and transport equipment (7.0) and may export to rest of the blocks.

It is recommended that countries under three distinct blocks may ultimately be merged into a cartel. Objective of



such cartel should be to maximise the collective benefits by adopting the appropriate policies and programmes conducive to their factor endowment structure. It is suggested that mere provision of incentives to the exporters may not be the appropriate trade policy and, therefore, an appropriate integration of trade policies with production planning with specific market-orientation may be more desirable and effective strategy for enhancing the export among NICs.

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